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**"Drain Brush"****Field of the Invention**

The present invention relates to a brush which can be associated with a drain such as the drain of a shower, bath or hand basin.

**5 Background Art**

There are a significant number of people with somewhat reduced physical capacity who have difficulty in washing their feet in the confined quarters of a shower recess or the rounded and slippery surface of a bath-shower combination. Such people have difficulty in either bending down to clean their feet or balancing on one foot while they clean the other. In addition even an adult without disabilities can have difficulty in cleaning the soles of their feet within a shower cubical. Therefore there is a perceived need for a cleaning means to enable such people to clean their feet without the need to bend down or balance on one foot and various attempts have been tried. Examples include GB2,280,849 (Waters) showing a foot cleaning platform for use in the shower, AU78246/94 (Shower Mate Products NZ Ltd) for a foot cleaning brush, AU20885/95 (Norin) for a multi function paediatric device and US 5,575,034 (Biernacinski) foot cleaning and massaging mat system. While all of these attempt to provide a solution they nevertheless have problems.

**20 Disclosure of the Invention**

Accordingly, the invention resides in a brush assembly adapted for mounting to a drain, the drain brush assembly comprising a housing adapted to be engaged with the drain to provide the inlet to the drain, a brush head supported by the housing to extend across the inlet, and a set of bristles extending from outermost axial face of the brush head, the brush head being supported by the housing to be resiliently depressible into the housing.

According to a preferred embodiment, the brush head further comprises a cylindrical sleeve adapted to be received within the housing, the sleeve being resiliently depressible into the housing.

According to a preferred feature of the invention, the brush head is removable  
5 from the housing to thereby be replaceable.

According to a preferred feature of the invention, the brush head is biased to an outermost position relative to the housing such that the outermost axial face of the brush head is substantially coplanar with the outer face of the housing. .

According to a preferred feature of the invention, the drain brush assembly is  
10 provided with a plurality of apertures adapted to enable, in use, waste liquid to flow through the apertures into the drain.

According to a preferred feature of the invention, the apertures provided by the grate in the brush head are interspersed within the area of the brush head provided with bristles to enable the drain brush assembly to filter solid matter and  
15 hair-like matter from the waste liquid.

According to a preferred embodiment, the drain head comprises a grate having a plurality of grate members and the apertures are provided by means of the spacing between grate members.

According to a preferred embodiment, the bristles extend from the grate  
20 members.

According to a preferred embodiment, the bristles are resiliently deformable.

According to a preferred feature of the invention, the feel of the brush assembly is determined by selecting a brush head having bristles of a selected stiffness.

According to a preferred feature of the invention, the feel of the brush assembly is  
25 determined by selecting a cylindrical sleeve having a particular compressibility.

According to a preferred embodiment, the housing is adapted to be received on the end of a drain pipe to provide the drain.

According to a preferred embodiment, the housing is adapted to be received in the drain inlet of an installed drain.

- 5 The invention will be more fully understood in light of the following description of several specific embodiments.

### **Brief Description of the Drawings**

The description is made with reference to the accompanying drawings of which:-

Figure 1 is an isometric view of an assembly according to the first embodiment;

- 10 Figure 2 is an exploded isometric view of the assembly according to the first embodiment;

Figure 3 is a plan view of the assembly according to the first embodiment;

Figure 4 is a sectional elevation of the assembly according to the first embodiment;

Figure 5 is a side elevation of the grate according to the first embodiment;

- 15 Figure 6 is an isometric view of the grate of the first embodiment;

Figure 7 is a plan view of the housing of the first embodiment;

Figure 8 is an exploded isometric view of an assembly according to the second embodiment;

- 20 Figure 9 is an isometric view of the assembly according to the second embodiment; and

Figure 10 is a sectional elevation the assembly according to the second embodiment;

### Detailed Description of Preferred Embodiments

Each of embodiments of the invention are directed to an assembly comprising  
5 brush adapted to be supported by a housing in order that it can be mounted to a drain of a shower recess or the like installation. Similar devices might also be applied to wash basins and other applications where it is appropriate to have a brush which is accessible to a user of the installation.

The first embodiment of the invention as shown in Figures 1 to 7 comprises a  
10 brush assembly which is adapted for installation to the drain in a shower recess, bath/shower combination, wash basin or the like. As shown the drain brush 11 of the first embodiment comprises a housing 14, a brush head 16 and a compression ring 18.

The housing 14 comprises a generally cylindrical skirt 21 having a rim 22 in the  
15 form of an outwardly directed flange at one end. The external perimeter of the rim 22 is constructed in the form of a regular polygon having an even number of sides to enable the rim 22 to be engaged by a suitable wrench or socket. The other end of the skirt is dimensioned and adapted to be receivable on the outer end of a drain pipe (not shown) and is formed of a suitable material. The rim 22 is  
20 intended to be received in the floor of the shower recess, bath or the like such that its outer axial face is generally flush with the floor and is intended to replace the conventional grate that is usually mounted to the end of the drain pipe in the shower recess or bath.

In addition the inner face of the skirt is formed with an inwardly directed flange 23  
25 intermediate of its length. The flanges each have a radially directed base portion 31 and an axially directed edge portion 32 extending from outer end of the innermost edge of the base portion 32 and in the direction of the one end. The edge portion 32 with the inner face of the skirt and the base portion 31 define a recess. The flange is discontinuous in that it is formed with two diametrically opposed

gaps 33 and each side of each gap is formed with an axial flange 37 which extends axially from the base portion 31 of the flange in opposed relation to the recess and which extends axially to have the same width as the flange 23. The axial flanges 37 at each gap are of differing lengths where the longest axial flange  
5 is located to the opposite sides of the opposed gaps .

In addition the inner face of the skirt 21 is formed at its one end with a portion of increased dimension to which defines a seat 24 at its inner end intermediate the one end and the flange 23.

The brush head 16 of the embodiment is comprised of two components, a grate  
10 41 and a collar 42 where the grate 41 is receivable in the collar 42 to be supported thereby and is fixed to the collar. The collar is receivable in the housing 14.

The grate 41 is circular and is formed with a set of grate members 45 which extend across an opening defined by an annular perimeter portion 43 of the grate.  
15 A closed inner zone 46 is defined in the centre of the grate. The perimeter portion 43 and the inner zone each support a set of bristles 51 which extend normally from the respective surfaces and where the set of bristles supported from the inner zone 46 are of longer length than the bristles supported by the perimeter portion. The bristles take the form of rod-like elements which are formed integrally  
20 with the grate 41. The grate 41 is formed of a suitable plastics material which is resilient and provides the bristles with a degree of flexibility so that the bristles are resiliently deformable from their normal orientation with a fair degree of stiffness. The reverse face of the grate is formed around its perimeter with an annular recess which accommodates a set of angularly equidistant lugs 48. The provision  
25 of the grate 41 within the brush head 16 provides a series of apertures within the brush head which enables waste-water to enter the drain through the drain brush assembly while providing sufficient support structure for the brush bristles.

The collar 42 is formed of a relatively rigid plastics material and comprises a tubular member having an external diameter which is substantially equal to the  
30 internal diameter of the flange 23 of the housing 14. The collar is formed at one

end with an outwardly extending support flange 62 which has an external diameter substantially equal to the internal diameter of the portion of the skirt 21 having the increased dimension. The internal periphery 63 of the support flange 62 is complementary to the configuration of the perimeter of the reverse face of the grate having the lugs 48. The inter-engagement of the lugs 48 of the grate with the inner perimeter of the support flange 62 serve to positively retain the grate in position in the collar. The exterior of the collar is formed with a pair of diametrically opposed first tab members 71 which are located proximate the other end of the collar. The first tab members are intended to cooperate with the gaps 33 in the flange 23 of the housing 14 to be received through the gaps when the collar is inserted into the housing such that the first tab members are brought into engagement with the flange.

The spacing of the tab members 71 from the one end of the collar is such that when the brush head is in engagement with the collar the spacing between the axial outer face of the grate 41 and the first tab members 71 is substantially equal to the spacing between the lower face of the flange 23 and the outer axial face of the one end of the housing 14. Therefore when the brush assembly is received in the housing 14 the outer axial faces of the housing and the grate are substantially coplanar and the bristles extend upwardly from the grate. In addition the seat 24 limits the degree of inward movement of the brush assembly into the housing by engaging with the innermost axial face of the support flange 62.

The compression ring 18 comprises an annulus of a resiliently compressible material having an inner diameter slightly larger than the outer diameter of the collar 42, an outer diameter slightly smaller than the inner diameter of the housing 14. The axial dimension of the compression ring 18 corresponds substantially to the spacing between the base of the recess defined by the flange 23 and the axial inner face of the support flange 62 of the collar when the axial faces of the grate and the housing of the assembled brush assembly are co-planar. The collar is resiliently deformable and may be provided from rubber, neoprene or suitable plastics material. In an adaptation of the embodiment, the compression ring 18 is replaced by a resilient means such as a helical spring to bias the brush head in an outward position.

In application of the brush assembly, the housing 14 is first mounted onto a drain pipe such that the rim is positioned to be received in the floor of the shower recess, bath or other appropriate site. The compression ring 18 is then applied around the collar between the support flange 62 and the first tab members. The brush head 16 is then inserted into the housing 14, with the first tab members 71 being aligned with the gaps 33 of the flange 23. As a result the lower axial face of the compression ring 18 is received in the recess of the flange 23 and will engage the base portion 31 of the flange 23. With further depression of the brush assembly into the housing, thereby the compression ring 18 is compressed until the first tab members 71 move axially beyond the shortest of the axial flanges 37. With rotation of the brush assembly within the housing the first tab members 71 are moved out of alignment with the gaps 33 and once then the brush assembly is released and allowed to move upwardly under the influence of the compression ring 18 until the first tab members contact the lower faces of the base portions 31 of the flange 23, thereby holding the brush head 16 within the housing 14. The longer of the ribs 37 prevent the brush head 16 from being rotated within the housing 14. The brush 16 is prevented from being inserted too far into the housing 14 by the axial inner face of the support flange of the collar step 66 engaging the seat 24 of the housing 14. Thus, the brush head is provided with a bayonet-like mounting means permitting easy and quick removal and replacement.

In use, the user applies a foot against the bristles and the brush head will move inwardly against the biasing of the compression member 18. The resilient flexibility of the bristles and the resilient compressibility of the compression ring are balanced to achieve the desired feel. Optionally, the compression ring and bristles can be supplied in a range of grades enabling the user to select a desired "feel" of the brush assembly. As the brush head is removable, it is easily replaceable in the event of damage or wear, or should a user require a different "feel".

As the apertures provided by the grate in the brush head are interspersed within the area of the brush head provided with bristles, the brush assembly of the first

embodiment also acts to prevent certain debris such as hair and dropped items from being washed into the drain and therefore serves a dual function.

The second embodiment as shown at Figures 8 to 10, comprises a brush assembly which can be used with an existing drain fitting 80 and can replace the  
5 existing grate of the drain. Such existing drains are formed with an inwardly directed radial flange 81 at a spacing from the outer end of the drain fitting 83 corresponding to the thickness of the existing grate and the radial flange is formed with a pair of opposed rebates which are intended to receive pawl members provided on the existing grate to enable the existing grate to be positively  
10 engaged with the drain fitting but to be capable of removal.

The embodiment comprises a brush assembly 11 which is of a similar form to the brush assembly of the first embodiment and therefore the same numerals will be used for corresponding component. The brush assembly comprises a tubular housing 14 which is intended to be received in the existing drain fitting 80 and  
15 which has a rim 22 which is to be received by the outer portion of the drain fitting 80 to be supported by the radial flange 81 and which has a pair of pawls which are received through the gaps 83 provided in the radial flange in order that the housing is engaged with the drain fitting 80 in the same manner as the existing grate of the drain fitting.

20 Generally the brush assembly 11 of the second embodiment is similar to the brush assembly of the first embodiment. In this regard the brush head 16 is almost identical to the brush head 16 of the first embodiment except that all of the bristles 51 have the same length and the pattern obtained from the arrangement of the members of the grate 41 differs. In addition the flange 23 is formed as a  
25 simple flange having a radial extent only. Furthermore the compressive ring 16 has a castellated configuration at one end to provide for a reduced resistance to the initial relative displacement between the brush head and the housing.

The support sleeve 121 comprises a tubular element having a simple flanged rim 122 at its upper end. It also has a pair of flanges 123 extending circumferentially  
30 around the inner surface of the tubular wall of the sleeve intermediate the ends.



The flanges correspond with flanges 23 of the first embodiment but are of simpler construction, as they do not have an axial wall portion. As with the flanges 23, the two flanges 123 are opposed to each other and are a little less than semi-circular to provide a pair of opposed gaps 133 between the corresponding ends of the  
5 flanges 123. The gaps 133 act to cooperate with tags 171 on the brush assembly 16 while the flanges provide a seat for the compression ring 118.

The sleeve 121 is also provided with a pair of opposed tags 181 on the external, tubular surface, the tags being positioned near the upper end. The tags are adapted to cooperate with flanges 133 generally constructed on the internal  
10 surface of the housing and which are similar in form to the flanges 123 on the inner surface of the tubular sleeve.

The drain brush of the second embodiment functions in a similar manner to that of the first embodiment except that the tubular sleeve is provided as an intermediate element between the housing and the brush assembly. As a result the  
15 embodiment can be used in existing installations.

Modifications and variations such as would be apparent to a skilled addressee are deemed to be within the scope of the present invention. It will be recognized that the pattern of the grate is determined primarily by aesthetics rather than by functional requirements and may be varied without departing from the scope of  
20 the invention. In addition, the relative heights of the bristles are selected to satisfy consumer choice and is not an aspect essential to the invention.

Throughout the specification, unless the context requires otherwise, the word "comprise" or variations such as "comprises" or "comprising", will be understood to imply the inclusion of a stated integer or group of integers but not the exclusion of  
25 any other integer or group of integers.